Precognitive priming and sequential effects in visual word recognition

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Statements

Statement of originality

I declare that this thesis presents my own original work and contains no material which has been accepted for a degree or diploma by any university or other institution, except by way of background information and duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by another person, except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

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I declare that the original experimental research reported in this thesis is based on analyses of data that, to the best of my knowledge, were exactly as participants freely contributed them and as accurately recorded at the time of contribution, and that any hypothesis of data-manipulation, whether befitting or not the hypotheses, is wholly untrue to the strict probity by which this research was fully intended and came to be conducted at all of its stages of production.

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Statement of ethical conduct

The research associated with this thesis abides by the international and Australian codes on human experimentation. It received approval from the Human Research Ethics Committee (Tasmania) Network (Application H0008548). All participants completed consent forms approved by the Committee upon being informed of the nature of the experimental tasks to which they contributed.

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Preamble

Psi research (encompassing parapsychology and psychical research) increasingly offers the following proposition: *Future information that persons have not or could not have inferred or incurred on the basis of past information can inform their present experience and behaviour.* Summarily, this is the hypothesis of *precognition*. This is not precognition of the usually suspected type. It is not of the dream that occasionally literally matches, in the bulk of its most salient details, an experience had soon upon awakening. It is not of the once-in-a-lifetime portent of death, with an unreasonable but a true idea of its hour. The hypothesis that is being increasingly offered, in psi research, is that precognition normatively functions in perception and cognition as it is classically conceived – not in anomalous experiences, not as supernatural or paranormal happenings, but as information that ordinary perception and cognition utilizes if not depends upon. It is this normative frameworking of precognition in particular, and psi hypotheses in general, that is pursued in this thesis, and specifically of precognition as it is operative in recognition.

There is what might be called a pan-paradigmatic implication of this frameworking of psi hypotheses – specifically, what it implies for the enduring question of the place of psi research within psychology; the question of "*What to do about ESP*"?, as E. G. Boring (1966, p. 42), the historian of psychology, posed in *Science*; and the question of "*How does one decide about ESP?*" as J. B. Rhine (1959, p. 606), the founding US parapsychologist, posed to his peers in *American Psychologist*. Experimental evidence for the operation of extra-sensory perception (ESP), and psi phenomena in general, has been repeatedly offered to the attention of psychologists, in their own journals. These include experimental reports by, for example, Alexander (2000), Bierman and Radin (1997), Haraldsson and Houtkooper (1992), Koren and Persinger (2002), McConnell, Snowdon, and Powell (1955), McDonough, Warren, and Don (1992), Roll, Persinger, Webster, Tiller, and Cook (2002), Schmeidler and Murphy (1946), Thouless (1942), and Watt and Morris (1995); and also interpretive and meta-analytical reviews of particular experimental series, such as by Bem and Honorton (1994), Bösch, Steinkamp, and Boller (2006), Burt (1961), Cadoret (1961), Child (1985), Milton and Wiseman (1999), Murphy (1975), K. R. Rao and Palmer (1987), J. B. Rhine (1936), Sargent (1981), Sherwood and Roe (2003), Storm and Ertel (2001), and Storm, Tressoldi and Di Risio (2010). (It might be noted that an APA president, and three BPS presidents, figure among these authors.) Responding to such reports has involved many unscientific but abiding approaches – "the Seven Veils" to psi, it seems: (1) ignore them; (2) distort their reporting; (3) object to their thinkability; (4) ever reject their evidentiality; (5) dismiss them as trivial; (6) suspend judgement until on-demand *heat-boils-water* replicability is assured in a *crucial* experiment; and (7) conform and reduce them to more reasonable hypotheses of sensorimotor, cognitive and neuropsychological aberration, i.e., altogether explain them away by any superficially valid hypothesis of classical psychology at hand. No psychologists would suffer isolation if they decided to take up such positions, to withdraw behind these veils; they would have therebehind, as companions, Skinner, Boring, Wundt, Ellis, Hilgard and Hyman (not only the abiding antagonist of psi research, but the discoverer of the repetition effect in choice reaction-time studies, of which more below).

The offer of precognition as a normative operation opens up a new and more scientifically worthy approach to the question of what to do about ESP, and how to decide about it. That is – to *question the evidence for psi according to its informativeness* to psychological propositions, methods and findings. Naturally, this requires, perhaps more than ever before, that psi research itself be well informed by the psychological. Fundamentally, and quite simply, in such a proposition as raised above, we are being invited to appreciate psi research as research into what the philosopher C. D. Broad (1949) called the *basic limiting principles* of knowledge and experience. With respect to precognition, psychology is pressed to query its abiding basic limiting principle that cognitive processes evolve in an asymmetrical linear flow from the past to the present; that mental processes progress in tick-tock synchrony with the Newtonian world-machine. This assumption can be questioned on a purely psycho-philosophical basis, such as Slife, the philosophical psychologist, has particularly pressed. Here is a quite presently pertinent reflection of his:

> Without an awareness that [temporal] linearity is a part of psychology's metaphysic, psychological researchers cannot be accused of confounding this assumption with their method. Yet, their method may incorporate linear time in a way that prohibits any true test of its validity. (Slife, 1995, p. 60)

What psi research offers, extra to such philosophy, are theoretical frameworks, experimental methods, and a vast database of findings relevant to questioning such limiting assumptions, and posing such fundamental questions. Perhaps in the days of Wundt, Boring, Skinner, and so on, as psychology was still asserting itself as a science, it was important to protect psychology from such fundamental queries, and the Seven Veils were quite academically functional even if scientifically unconscionable. Having passed over this challenge, and seeing that the questions of psi research have evolved into questions of its normative informativeness, psychology's capacity to be informed by such fundamental enquiry is now itself in critical scientific question.

The present thesis takes up such fundamental enquiry with a very tight focus – essentially, testing cognitive psychology's assumptive model of time by putting the question of precognition to questions of recognition, and specifically, of visual word recognition. The findings to be reported, via three experiments, can, it should be immediately told, be seen to well support at least the motivation of this enquiry, and this approach to the question of psi research. If readers experience some incredulity with regard to the findings to be reported, that is quite appreciable, and the present author himself remains sceptical about their interpretation. But to take the popular pseudo-sceptical position of blindly sheeting the findings immediately home-and-hosed to some freely-wheeled conventional hypothesis, such as weird inference, sheer incompetence or bloody fraud, however bizarre and unkind these would be to imagine, would betray a lack of intellectual courage that the present state of psychological enquiry neither demands nor deserves.

Abstract

The proposition that psi is operative not as an anomaly but as a normative component of information processing was investigated, focusing on the normative operation of precognition. Distinct to prior paradigms of precognition research that measure exact identification of stimuli, it was considered most informative, for the proposition of psi's normativeness, to investigate its operation as a context effect, and, specifically, as priming and sequential effects.

Evidence for psi's operation as a priming effect was firstly examined, and a priming paradigm involving continuous lexical decision was deemed, on the basis of prior research, to be potentially informative. As to what information could be precognitively primed, the question of retrieval, under a precognition condition, of imaginal and ideational information was addressed, in Experiment 1, in the form of post-response orthographic and semantic priming. Together with observations of classical past-to-present priming, precognitive semantic priming was observed, as was precognitive orthographic priming involving nonwords, in the speed and, partially, the accuracy of lexical decisions. Discussion related the results to theories of visual word recognition as well as precognition.

Precognition as a sequential effect was then examined. Using data from a prior experiment in lexical decision that sensitised accuracy over speed as the relevant measure, a precognitive alternation effect was observed in the presence of a classical repetition effect; specifically, responses to words were more accurate when the prior stimulus was a word, and when the subsequent ("precognitive") stimulus was a nonword, while responses to nonwords showed no reliable sequential effects. The possible role of sequential artefacts in randomly allocating targets and conditions was examined but found not to disconfirm the precognition hypothesis, while meriting further study. A third experiment sought to replicate this ostensibly precognitive alternation effect in lexical decision latency, while also manipulating nonword lexicality so as to identify a psychological basis for the effect that would conceptually, rather than statistically, preclude the operation of randomisation artefacts. The precognitive alternation effect was again observed – but (again) only in error-rate, and only on word trials. No nonword lexicality effect, and no artefacts of randomisation, appeared to modulate this effect. In the classical direction of sequences, word and nonword repetition effects were observed, modulated by nonword lexicality. These findings again merited discussion in relation to theories of both visual word recognition and precognition.

General discussion further concerned the possible role of precognition in visual word recognition, and the informativeness of context effects paradigms of psi research in addressing such possibilities.

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